

What is claim d is:

1. A process for manufacturing a semiconductor device comprising the steps of:
 - forming a transparent film on a semiconductor substrate
 - 5 including a photoelectric conversion section, the transparent film having a concave portion above the photoelectric conversion section;
 - forming a material film on the transparent film, the material film being made of a photosensitive material having a refractive index higher than that of the transparent film; and
 - 10 irradiating selectively a predetermined portion of the material film with rays, and then developing the material film, whereby forming an intralayer lens having a convex portion facing the concave portion.
- 15 2. The process for manufacturing a semiconductor device according to claim 1, wherein the material film is made of an ultraviolet curing resin containing a metal oxide.
3. The process for manufacturing a semiconductor device
20 according to claim 1, wherein the material film is made of a resin containing a metal oxide, wherein the resin becomes alkali-soluble by ultraviolet irradiation.
4. The process for manufacturing a semiconductor device
25 according to claim 2, wherein the metal oxide comprises at least one of a zirconium oxide and a titanium oxide.

5. The process for manufacturing a semiconductor device according to claims 1, wherein the material film is developed by an alkali solution containing a tetramethylammonium hydroxide.

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6. A semiconductor device comprising: a semiconductor substrate including a photoelectric conversion section; a transparent film formed on the semiconductor substrate, the transparent film having a concave portion above the photoelectric conversion section; and an intralayer lens formed on the transparent film, the intralayer lens having a convex portion facing the concave portion, the intralayer lens being made of a photosensitive material having a refractive index higher than that of the transparent film.

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15 7. The semiconductor device according to claim 6, wherein the photosensitive material is an ultraviolet curing resin containing a metal oxide.

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25 8. The semiconductor device according to claim 6, wherein the photosensitive material is a resin, wherein the resin contains a metal oxide and becomes alkali-soluble by ultraviolet irradiation.

9. The semiconductor device according to claim 7, wherein the metal oxide comprises at least one of a zirconium oxide and a titanium oxide.